

than restoration of the Homestead—has become the preferred alternative.

Research changed the Board's direction on another occasion. The draft vision statement for RittenhouseTown called for all seven buildings to be restored to recreate a colonial village. An historic structure report in 1997, however, concluded one of the houses was built in 1840. Thus, the colonial emphasis was finally modified by factual information. The vision statement now calls for the preservation of the 18th- and 19th-century industrial village.

The Board has sponsored several other kinds of studies for RittenhouseTown. A professionally supervised dig exposed a corner of the paper mill's massive stone foundation. This archeology led to funding for an interpretive design study on the mill site. A master plan for RittenhouseTown mapped out the village's historical and archeological resources. A design firm researched and prepared an excellent exhibit time line for the visitor center, and a research historian prepared a handbook on RittenhouseTown's history. A landscape architect completed a study on the site's access problems, while a museum grant made recommendations for collections' management.

In the future, Historic RittenhouseTown will require additional studies, including a cultural landscape report for a planned wayside trail and historic structure reports for two houses currently

leased to Fairmount Park. Some Board members have been impatient with research that has consumed needed dollars for restoration and interpretation, but the information obtained in this process has allowed the Board to answer critical questions about the site's future.

The Board hopes to expand the papermaking program and interpret the village of RittenhouseTown from the mill's origin to the present. Expansion, however, is currently limited by the site's rural characteristics and its setting. The village's septic system restricts the visitor center to one public toilet. More bathrooms can be added when a sewer line is installed, but estimates to run the line in the village top \$400,000. Public access and parking are limited by the site's hilly contours and its proximity to Lincoln Drive, a fast-moving, but scenic commuter road. Public access also must be considered in the light of neighborhood concerns and the Board's effort to keep cars and buses from traversing the village. The future of Historic RittenhouseTown will thus need the continued cooperation of many diverse professionals, neighbors, community groups, and volunteers who together will determine the future of this National Historic Landmark.

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Rodman Last of the Seacoast Muzzle-Loaders

The Rodman gun, shown here at Fort McHenry, was the last smoothbore muzzle loader used in American coastal defense during the late-19th century. Photo courtesy Ft. McHenry NMHS.

Fort McHenry National Monument and Historic Shrine has the largest surviving collection of Rodman guns in the United States. While the names Dahlgren, Parrot, and Napoleon are synonymous with artillery, few come close to the Rodman, the last of the smoothbore muzzle loaders to guard the American coast during the last half of the 19th century.

Thomas Jackson Rodman, an Army ordnance officer who graduated from West Point in 1837, developed the Rodman gun. Rodman's commission in the Ordnance Department enabled him to study cannon casting methods at the nation's leading foundries.



In February 1844, Rodman was one of several officers and dignitaries who witnessed the firing of the "Peacemaker," a large gun aboard the U.S.S. *Princeton* in the Potomac River near Washington, DC. The gun exploded upon firing, killing the Secretary of War and several others.

This experience prompted Rodman to investigate his own theories about gun casting. Discovering that current manufacturing processes produced structurally-weak guns, Rodman thought that casting solid guns and then boring them out caused structural stresses. Cooling guns from the outside caused the cannon to develop strata of dif-

ferent densities, making the tube more susceptible to bursting.

Rodman developed a method of casting the gun barrel around a hollow core or pipe, sealed at the bottom. The mold stood muzzle-up and a small pipe was lowered into the core. When a foundry worker released molten iron into the mold, water flowed into the smaller pipe. This water filled the inner core and ran off at the gun muzzle, away from the casting. Hot coals heaped around the guns exterior insured even cooling. As the iron cooled outward, each successive layer compressed down on the top of the layer under it. The result was a firm, tight casting without any dangerous cracks or air fissures. Rodman also reduced the stresses placed on the bore from gunpowder by increasing the diameter of the powder grains. This produced more uniform pressure on the shot, increasing its velocity during its passage through the bore.

After several unsuccessful attempts to convince the Army to try his process, Rodman applied for a patent in 1847. In 1849, he signed a production agreement with Charles Knapp of the Fort Pitt Foundry in Pittsburgh and continued to experiment on the process for the next several years. After a decade of experimental castings, the War Department ordered Rodman to cast a 15-inch smoothbore. Called the "Lincoln Gun," it was the largest gun produced in the U.S. and passed all trials at Fort Monroe, Virginia. The U.S. Army subsequently adopted the Rodman process.

In late 1864, the Army began replacing Fort McHenry's former Model 1842 seacoast guns with Rodmans. On June 30, 1866, five 15-inch Rodmans were mounted. In the next decade, several 8-inch and 10-inch guns were also mounted. In 1865, the Army breveted Rodman with the ranks of lieutenant general, colonel, and brigadier general for his meritorious service and placed him in command of the Rock Island, Illinois Arsenal, where he served until his death in 1871.

Rodman's new process revolutionized coastal armaments in the U.S. These smoothbore guns lost favor, however, as the superiority of rifled barrels became evident against older forts. As Rodman perfected his process, rifled artillery was being cast that made all smoothbore cannons obsolete. A pointed projectile could travel further and with greater accuracy, easily penetrating walls and thus making

coastal forts "fortresses of the past." After the war, many Rodmans were converted to muzzle-loading experimental rifles by inserting 8-inch rifled liners. Fort McHenry's Rodmans were last fired on July 3, 1903, nine years before the Army deactivated the Fort in 1912 and 13 years before it became a national park.

With 14 Rodmans in its collection, the largest in the U.S., Fort McHenry NMHS faces the challenge of interpreting and preserving these mammoth guns for the public. The park presents a 30-minute program on one of the five mounted 15-inch Rodmans, which includes a sketch of Rodman's life, a review of his metallurgical achievements, and a discussion of the guns' operation and significance.

Fort McHenry has collected copies of primary and secondary archival materials on the Rodmans from the National Archives and the Rock Island Arsenal Museum and assembled them as the Historical and Archeological Research Project. To preserve the guns, every few years the park blasts the guns with walnut shells to remove old paint and applies a new layer. Because Fort McHenry lies 200 miles inland, salt corrosion is less of a problem than at other Rodman sites. Despite 120 years of exposure to pollution, this fine collection has weathered the elements.

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From left foreground to right, three experimental 10-inch with 8-inch rifled sleeves (foreground), three 8-inch, and a 15-inch Rodman fire a national salute. The Rodman guns at Fort McHenry were last fired on July 4, 1903. Note the cranes used for hoisting shells. This view is one of only four known photographs of the Rodmans being fired. Photo courtesy Ft. McHenry NMHS.

